

CLAIMS

What is claimed is

1. A laboratory mixing device comprising:
 - a. at least one reactor;
 - b. a wheel encompassing the at least one reactor such that the axis of the wheel is substantially coaxial with the at least one reactor;
 - c. at least one drive magnet positioned upon the wheel and rotatable, the at least one drive magnet comprising at least one permanent magnet and providing opposite magnetic poles upon the wheel; and
 - d. at least one mixer comprising a permanent magnet positioned within the at least one reactor, wherein a magnetic coupling between the at least one drive magnet and the mixer results in rotation of the mixer when the at least one drive magnet rotates.
2. The laboratory mixing device of claim 1 wherein the at least one reactor comprises a plurality of cylindrical reactors.
3. The laboratory mixing device of claim 2 further comprising a plurality of wheels, each of the plurality of wheels encompassing the plurality of cylindrical reactors and each of the plurality of wheels having at least one drive magnet positioned thereon.
4. The laboratory mixing device of claim 1 wherein the at least one drive magnet comprises two permanent magnets positioned upon the wheel.
5. The laboratory mixing device of claim 4 wherein the two permanent magnets are directly opposed upon the wheel.
6. The laboratory mixing device of claim 1 wherein the wheel is rotatable.

7. The laboratory mixing device of claim 6 wherein the wheel is rotated by a belt.
8. The laboratory mixing device of claim 7 wherein the belt is driven by a pulley.
9. The laboratory mixing device of claim 8 wherein the pulley is driven by a motor.
10. The laboratory mixing device of claim 6 wherein the wheel is driven by a gear operably engaged with the drive shaft of a motor.
11. The laboratory mixing device of claim 1 wherein the reactor defines a central axis and the wheel is adjustable with respect to the at least one reactor along the central axis.
12. The laboratory mixing device of claim 11 wherein the wheel is positioned upon a lift.
13. The laboratory mixing device of claim 12 wherein the lift is operable to be moved parallel to the central axis.
14. The laboratory mixing device of claim 13 wherein the lift is driven by a lift handle and gear mechanism.
15. The laboratory mixing device of claim 1 further comprising at least one reactor holder encompassing the at least one reactor such that the wheel encompasses the at least one reactor holder.
16. The laboratory mixing device of claim 15 wherein the at least one reactor holder partially encompasses the at least one reactor.
17. A method of mixing a solution in at least one reactor comprising:
 - a. providing a wheel encompassing the at least one reactor such that the axis of the wheel is substantially coaxial with the at least one reactor;
 - b. providing at least one drive magnet upon the wheel such that the drive magnet is rotatable with respect to the reactor;

- c. providing at least one mixer comprising a magnet positioned within the at least one reactor; and
 - d. rotating the at least one drive magnet such that a magnetic coupling between the at least one drive magnet and the mixer results in rotation of the mixer within the at least one reactor.
- 18. The method of claim 17 wherein the at least one drive magnet comprises two permanent magnets positioned upon the wheel.
 - 19. The method of claim 18 wherein the two permanent magnets are directly opposed upon the wheel.
 - 20. The method of claim 17 wherein the step of rotating the at least one drive magnet comprises rotating the wheel.
 - 21. The method of claim 20 wherein the step of rotating the wheel includes moving a belt to rotate the wheel.
 - 22. The method of claim 21 wherein the step of moving the belt includes driving a pulley to move the belt.
 - 23. The method of claim 22 wherein the step of driving the pulley includes driving a motor to drive the pulley.
 - 24. The method of claim 20 wherein the step of rotating the wheel includes driving a gear that meshes with teeth on the wheel.
 - 25. The method of claim 17 further comprising the step of moving the wheel with respect to the at least one reactor along a central axis.
 - 26. The method of claim 25 wherein the wheel is positioned upon a lift.

27. The method of claim 26 further comprising the step of cranking a lift handle to operate the lift.
28. The method of claim 17 further comprising the step of providing a reactor holder that encompasses the reactor such that the wheel encompasses the at least one reactor holder.
29. A mixing apparatus comprising:
 - a. at least one reactor defining an axis;
 - b. at least one wheel encompassing the at least one reactor and arranged and disposed to rotate about the at least one reactor;
 - c. at least one magnet positioned upon the at least one wheel; and
 - d. a lift arranged and disposed to move the at least one wheel parallel to the axis of the at least one reactor.
30. The mixing apparatus of claim 29 wherein the at least one reactor comprises a plurality of reactors.
31. The mixing apparatus of claim 30 wherein the at least one wheel comprises a plurality of wheels.
32. The mixing apparatus of claim 30 wherein the at least one magnet includes a plurality of magnets.
33. The mixing apparatus of claim 29 further comprising at least one mixer disposed within the at least one reactor and in magnetic communication with the at least one magnet.
34. The mixing apparatus of claim 31 wherein the plurality of wheels are supported by a mixer case.
35. The mixing apparatus of claim 29 wherein the at least one wheel is driven by a pulley.
36. The mixing apparatus of claim 29 wherein the at least one wheel is driven by a gear.